AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An adaptive, indirect ~~sensorless~~ position sensing apparatus for deriving rotor position of a synchronous machine, said apparatus comprising:

a first rotor position deriving unit for generating first rotor position values by applying a first indirect ~~sensorless~~ rotor position calculation technique, which emulates a resolver, wherein said first indirect rotor position calculation technique generates first rotor position values as a function of AC excitation supplied to a field winding of the synchronous machine rotor;

a second rotor position deriving unit for generating second rotor position values by applying a second indirect ~~sensorless~~ rotor position calculation technique; and

a rotor position result output unit for outputting rotor position results over a range of rotor speeds as a function of said first rotor position values, said second rotor position values, and rotor speed.

2. (Original) The position sensing apparatus of claim 1, further comprising:

a control unit for controlling said rotor position result output unit as a function of rotor speed.

3. (Original) The position sensing apparatus of claim 1, wherein

said rotor position result output unit outputs said first rotor position values as rotor position results during a first operating mode, and

said rotor position result output unit outputs said second rotor position values as rotor position results during a second operating mode.

4. (Original) The position sensing apparatus of claim 3, wherein said rotor position result output unit operates in said first operating mode at low rotor speeds and operates in said second operating mode at higher rotor speeds.

5. (Original) The position sensing apparatus of claim 3, wherein

said apparatus further comprises a control unit for controlling said rotor position result output unit as a function of rotor speed,

said rotor position result output unit outputs said first rotor position values as rotor position results during a third operating mode, and

said control unit executes a phase-locked loop operation to control said second rotor position deriving unit during said third operating mode, such that errors between second rotor position values and first rotor position values are reduced.

6. (Original) The position sensing apparatus of claim 3, wherein said rotor position result output unit outputs a weighted combination of first and second rotor position values during a transitional operating mode.

7. (Original) The position sensing apparatus of claim 6, wherein said rotor position result output unit operates in said transitional operating mode over a range of rotor speeds, such that second rotor position values are given more weight as rotor speed increases.

8. (Original) The position sensing apparatus of claim 1, wherein said first rotor position deriving unit comprises:

a bandpass filter that filters phase voltage signals output from main stator windings of said synchronous machine during AC excitation, thereby extracting a rotor position-indicating component from said phase voltage signals; and

a converter that converts the filtered phase voltages into balanced two-phase quadrature signals, said balanced two-phase quadrature signals indicating positioning of said rotor.

9. (Original) The position sensing apparatus of claim 1, wherein said synchronous machine is a synchronous brushless machine.

10. (Original) The position sensing apparatus of claim 1, wherein said rotor is on a shaft coupled to a gas turbine engine of an aircraft.

11. (Original) The position sensing apparatus of claim 8, wherein the two-phase quadrature signals are used as inputs to emulate a position sensor in a drive system for the synchronous machine.

12. (Original) The position sensing apparatus of claim 11, wherein the two-phase quadrature signals are used as inputs to emulate a resolver.

13. (Currently Amended) The position sensing apparatus of claim 1, wherein said second ~~sensorless~~indirect rotor position calculation technique calculates rotor position based on back EMF.

14. (Currently Amended) An adaptive, ~~sensorless~~indirect position sensing method for deriving rotor position of a synchronous machine from signals output from said machine, said method comprising:

generating first rotor position values by applying a first ~~sensorless~~indirect rotor position calculation technique, which emulates a resolver, wherein said first indirect rotor position calculation technique generates first rotor position values as a function of AC excitation supplied to a field winding of the synchronous machine rotor;

generating second rotor position values by applying a second ~~sensorless~~indirect rotor position calculation technique; and

outputting rotor position results over a range of rotor speeds as a function of said first rotor position values, said second rotor position values, and rotor speed.

15. (Original) The position sensing method of claim 14, further comprising:

controlling said outputting step as a function of rotor speed.

16. (Original) The position sensing method of claim 14, wherein

said outputting step outputs said first rotor position values as rotor position results during a first operating mode and outputs said second rotor position values as rotor position results during a second operating mode.

17. (Original) The position sensing method of claim 16, wherein said first operating mode is executed at low rotor speeds and said second operating mode is executed at higher rotor speeds.

18. (Original) The position sensing method of claim 16, wherein

said rotor position output unit outputs said first rotor position values as rotor position results during a third operating mode, and

said method further comprises executing a phase-locked loop operation during said third operating mode to reduce errors between second rotor position values and first rotor position values.

19. (Original) The position sensing method of claim 16, wherein said outputting step outputs a weighted combination of first and second rotor position values during a transitional operating mode.

20. (Original) The position sensing method of claim 19, wherein said outputting step operates in said transitional operating mode over a range of rotor speeds, such that second rotor position values are given more weight as rotor speed increases.

21. (Currently Amended) The position sensing method of claim 14, wherein said first ~~sensorless~~indirect rotor position calculation technique comprises:

bandpass filtering phase voltage signals output from main stator windings of said synchronous machine during AC excitation, thereby extracting a rotor position-indicating component from said phase voltage signals; and

converting the filtered phase voltages into balanced two-phase quadrature signals, said balanced two-phase quadrature signals indicating positioning of said rotor.

22. (Original) The position sensing method of claim 14, wherein said synchronous machine is a synchronous brushless machine.

23. (Original) The position sensing method of claim 14, wherein said rotor is on a shaft coupled to a gas turbine engine of an aircraft.

24. (Original) The position sensing method of claim 21, wherein the two-phase quadrature signals are used as inputs to emulate a position sensor in a drive system for the synchronous machine.

25. (Original) The position sensing method of claim 24, wherein the two-phase quadrature signals are used as inputs to emulate a resolver.

26. (Currently Amended) The position sensing method of claim 14, wherein said second ~~sensorless~~<u>indirect</u> rotor position calculation technique calculates rotor position based on back EMF.